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| APPLICATION NO.   | FILING DATE        | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.                               | CONFIRMATION NO.                          |
|---|--------------------|----------------------|---|---|
| 10/533,604  | 04/29/2005         | Tomitaro Hara        | 112857-447  | 4564                                      |
| 29175<br>K&L Gates LLP<br>P. O. BOX 1135<br>CHICAGO, IL 60690 | 7590<br>07/15/2009 |                      | <div>EXAMINER</div> <div>NGUYEN, KHANH TUAN</div> |   |
|   |                    |                      | <div>ART UNIT</div> <div>1796</div>               | <div>PAPER NUMBER</div>                   |
|   |                    |                      | <div>MAIL DATE</div> <div>07/15/2009</div>        | <div>DELIVERY MODE</div> <div>PAPER</div> |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/533,604

**Applicant(s)**

HARA ET AL.

**Examiner**

KHANH T. NGUYEN

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18-19 and 21-35 is/are pending in the application.
- 4a) Of the above claim(s) 22-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18, 19, 21 and 35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date n/a.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed on 05/26/2009 is entered and acknowledged by the Examiner. Claims 18-19, 21-34 and newly added claim 35 are currently pending in the instant application. Non-elected claims 22-34 have been withdrawn from further consideration. Claims 1-17 and 20 have been canceled.
2. Applicant's arguments, see pages 10-13, filed on 05/26/2009, with respect to the rejection(s) of claim(s) 18, 19 and 21 under 35 U.S.C 103 (a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of JP 61-151241 A.

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 18, 19, 21 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 61-151241 A (hereinafter refer to as Miyake). A full English translation of the instant publication has been requested and will be provided.

**At the Abstract, Miyake teaches an ion-exchange membrane (proton conductor) composed of a carboxyl group-containing polymer.** The carboxyl group-containing polymer is readable on the first compound of Claim 1, wherein protoic dissociation group (X) is a carboxyl group, i.e.  $-\text{COOH}$  group, as recited in Claim 21. **Miyake teaches the ion-exchange membrane is immersed or coated with an amide solvent or solution thereof thereby impregnating the membrane with 0.1-50 wt. % of the solvent.** The amide solvent or solution is considered to include an amide compound having a structure similar to that of the second compound of Claim 1. Further, the amide solvent of Miyake is considered to encompass N,N-dimethyl formamide (DMF) and N-methyl formamide (MF) as recited in Claim 19, since DMF and MF are known organic solvent that are useful for producing or modifying membranes\*. Thus, Miyake is considered to suggest impregnating of carboxyl group-containing polymer membrane (first compound film) with the amide solvent (second compound) as recited in Claim 1.

While Miyake does not expressly suggest the ratio of b (number of moles of the second compound) to the number of moles of the protoic dissociation group ((a (number of moles of the first compound)) x n) is  $\leq 10$  to  $\geq 30$  as recited in Claim 1. Miyake also does not expressly suggest the  $=\text{NCOH}$  group of the second compound interacts with the protoic dissociation group (X) and causes a proton of the protoic dissociation group

to dissociate from the first compound upon application of an electric field as recited in Claim 35.

Nonetheless, the examiner takes the position that Miyake teaches an ion-exchange membrane composed of the same or substantially similar ingredients, e.g. carboxyl group-containing polymer and amide solvent, that is produce by the same or substantially similar process, i.e. impregnating the carboxyl group-containing polymer with amide solvent, thus the =NCOH group of the amide solvent (second compound) is expected to be capable of interaction with the carboxyl group (protoic dissociation group (X)) of the carboxyl-containing polymer (first compound) and causes a proton of the carboxyl group to dissociate from the polymer upon application of an electric field as recited in Claim 35. Furthermore, the number of moles  $b$  and protoic dissociation group ( $a \times n$ ) of Miyake is expected to be similar to the claimed moles since Miyake teaches the same or substantially similar ingredients prepared by the same method (impregnation). Thus, the ratio of  $b$  (number of moles of the second compound) to the number of moles of the protoic dissociation group is expected to be within the claimed range of  $\leq 10$  to  $\geq 30$  as recited in Claim 1. Moreover, the modification necessary to meet the claimed limitations, such as arriving at the claimed ratio of  $b/(a \times n)$  would have been within the purview of the skilled artisan through routine experimentation for best results. In view of the foregoing, the above claims have failed to patentably distinguish over the applied art.

***Other Prior Art Cited***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

"U.S. Pat. 5,643,968 to Andreola et al. teach a process for producing ion-exchange membranes comprising an amide solvent such as N,N-dimethyl formamide (DMF) (See Title and Col. 5, 2-5).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 18, 19 and 21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHANH T. NGUYEN whose telephone number is (571) 272-8082. The examiner can normally be reached on Monday-Friday 7:00-4:00 EST PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Kopec/  
Primary Examiner, Art Unit 1796

/KTN/  
Examiner  
07/09/2009